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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/733,099

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Je-Young Chang

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EXAMINER

WILSON, GREGORY A

ART UNIT

PAPER NUMBER

3749

MAIL DATE

DELIVERY MODE

07/08/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/733,099	Applicant(s) CHANG ET AL.	
	Examiner Gregory A. Wilson	Art Unit 3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15,16,18-21 and 25-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15,16,18-21 and 25-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the particles (SEE line 3 of claim 15 and in claim 31) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 15, 16, 18-21, and 25-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The applicant has included language further defining the second structure around the first structure to wet the first structure with the coolant. However, the specification supports a wick 120 which has axial grooves that act to bring coolant from the condenser portion of the heat pipe 100 to the evaporator portion at or near boiling structure 130. The alternate embodiment of the wick including particles of a second size is not described in the specification as to its functionality of wetting the first structure (SEE paragraphs [0013-0014]).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 15, 16, 18, 19, 25-30, and 32-37 are rejected under 35 U.S.C. 102(b) as being anticipated by **Calhoun et al (4,351,388)**. **Calhoun et al** discloses a device (heat pipe 11, this also represents the casing) having a coolant (ammonia), a first structure including particles (14) having an average diameter greater than 50 μm as evidenced by the fact that the particles are bigger than the mesh dimension $W_b=355.6 \mu\text{m}$ (0.014 inch), and is capable in helping convert some of the coolant from liquid to vapor (as evidenced by the vapor that enters vapor space 21), the particles (14) are glass beads which have a first thermal resistance, a second structure (15) surrounds the first structure and wets the beads with coolant from multiple sides, extends over the surface of the beads in such a way that pooling can be supported within the second structure over the beads; the second structure is made of stainless steel wire mesh (which has a second thermal resistance), the plurality of outer walls that enclose the second structure in an air tight manner is represented by elements (11, 17, 22). With regards to claims 25-29 and 32-37, Calhoun et al discloses another embodiment which anticipates the applicants invention, namely, a device (heat pipe 11) having a boiling structure (15) formed of a first porous material and contains particles (beads 14) within the structure and a wick structure (22) which is installed against a composite wick (13) and together surround the boiling structure (15) including extending over the top surface (as shown in Figure 1) and is capable of bringing the coolant to the boiling structure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 20-21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Calhoun et al (4,351,388) in view of Kroliczek et al (6,564,860). Calhoun et al discloses the applicants primary inventive concept as stated above, but does not specifically teach a fan to move air across a portion of the heat pipe. It is very well known in the art to supply a blower or fan and is discussed in Kroliczek et al that fans are used to accompany heat pipes to dissipate the heat from the heat source. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains to have incorporated a fan as is well known in the art and taught by Kroliczek et al with the system as taught by Calhoun et al for the purpose of moving air across the heat pipe to disperse the heat and also provide cooling to the heat pipe.

Claims 31 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Calhoun et al. Calhoun et al discloses the applicants primary inventive concept, as stated above, but does not specifically recite that the particles include copper. As mentioned above, Calhoun et al discloses glass beads as the particle. The applicants specification does not specify the importance of its choice of copper as the material for

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the particles and it is henceforth concluded that it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose copper as the material for the particles, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended used as a matter of obvious design choice.

Response to Arguments

Applicant's arguments filed 3/12/08 as they pertain to the objection to the drawings have been fully considered but they are not persuasive. Element (120) shows the wick which is a porous structure, it appears that the fine dot pattern shown in the Figures 1-4 are indicative of the pores of the wick, and are not clearly defined as being particles. Examiner acknowledges the cancellation of claim 17. The applicant argues that:

Calhoun arguably discloses a heat pipe that relies on heat and differential pressure to vaporize the coolant and then condense the vapor. Calhoun at Figures 2 and 3 arguably discloses a heat pipe with outer envelope 11 and a stainless steel screen structure 15 containing wick core 14 which is composed of glass beads. By way of contrast, the claimed subject matter discloses "a first structure having a first thermal resistance and including particles of a first size having an average diameter greater than about 50 gm to convert some of the coolant from liquid to vapor" and "a second structure around the first structure to wet the first structure with the coolant from multiple sides and having a second thermal resistance that is greater than the first thermal resistance and including particles of a second size, the second size is less than the first size." The claimed subject matter further comprises "a plurality of outer walls" that encloses the coolant, the first structure and the second structure.

The applicant argues that the prior office action fails to cite to a portion of Calhoun that shows a first structure containing particles of a first size. The examiner respectfully disagrees and maintains that **the glass beads constitute the first structure**, in view of the applicants claim of a first structure [having a first thermal resistance] including particles having a diameter greater than about 50 μm to convert some of the coolant from liquid to vapor, which is being interpreted by the examiner as the first structure includes particles of a first size as being at least part of the first structure. With regards to applicants argument that Calhoun does not disclose particles of a first and a second size, the second size being less than the first size, the examiner respectfully disagrees and suggests that the size of the particles of Calhoun (14) can come in a variety of sizes. The disclosure of Calhoun discuss the fluctuation of bead sizes in column 2, lines 54-69, furthermore, the specification of the applicants invention discusses the average diameter of the particles in the boiling structure to have a particular diameter, but does not offer support for a variety of particles of different sizes as constituting the boiling structure, as interpreted by the examiner.

With regard to the applicants argument as it pertains to the thermal resistance between the first and second structures, the examiner notes that thermal resistance is an object property and depends on both the resistivity of the material and its overall thickness within that particular object. Element (15) is made of stainless steel which has a higher thermal resistance than the glass beads (14) in order to maintain the beads within the enclosure, otherwise a failure of the stainless steel would expose and damage the glass beads. With regard to the applicants argument that stainless steel

screen 15 and its wick core 14 constitute a single structure, the examiner respectfully disagrees and maintains the position that the wick core of glass beads (14) constitute one structure and the screen (15) around the beads constitute an additional structure.

With regards to applicants arguments as it pertains to Calhoun in view of Kroliczek et al, the examiner maintains that the combination of Calhoun in view of Kroliczek et al is proper for reasons analogous to the previously presented arguments of claim 15 by the examiner of Calhoun.

With regards to applicants arguments as it pertains to claims 31 and 38, the examiner maintains previous argument and directs applicants attention to the arguments previously presented as it pertains to the limitations presented in the claims from which they depend.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory A. Wilson whose telephone number is (571)272-4882. The examiner can normally be reached on 7 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve McAllister can be reached on (571) 272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregory A. Wilson/
Primary Examiner, Art Unit 3749
July 6, 2008